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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,561	03/09/2001	Tomitaro Hara	09792909-4805	7307

26263 7590 06/23/2003

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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

8

DATE MAILED: 06/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/803,561	HARA ET AL.	
	Examiner	Art Unit	
	Tracy Dove	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

This Office Action is in response to the communication filed on 5/19/03. Applicant's arguments have been considered, but are not persuasive. Claims 1-3 and 5-13 are pending. Claim 4 has been canceled. This Office Action is made **FINAL**, as necessitated by amendment.

Specification

The objection to the specification has been withdrawn.

Claim Objections

Claim 1 is objected to because of the following informalities: the claim recites "negative electrode 10", however, the reference numeral 10 refers to the positive electrode current collector (see page 6, line 3). Examiner suggests deleting the reference numeral from claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 13 recites "a molar ratio of the diene compound to lithium of the positive electrode is from 0.01-0.05", which does not appear to be supported by the specification as filed. Note the

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specification teaches lithium is a material which may be used for the negative electrode active material (see page 9, line 7-page 10, line 7).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 5-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "said diene compound is in a range of 0.0001 mol to 0.0005 mol per one gram of the positive electrode active material", which is indefinite. It is unclear what the claim encompasses because in order to determine the amount of the diene compound, the diene compound and the components of the active material would have to be known. The claim should recite the same units for measuring the amount of the diene compound and the amount of the active material, otherwise it is not possible to convert between the two units of measurement in claim 1. Claim 1 will be examined as reciting "said diene compound is contained in the positive active material".

Claim 5 recites the limitations "the side positive electrode", "the side negative electrode" and "said diene compound". There is insufficient antecedent basis for these limitation in the claim. Claims 5 should have been rewritten to include all the limitation of original claims 1, 3 and 4. Since claim 4 has been incorporated in to claim 1, Examiner suggests Applicant amend claim 5 from independent form to dependent form, dependent upon claim 1.

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Claim 6 recites the electrolyte is "in a gelated state". However, claim 1 (claim 6 depends from) recites "a solid electrolyte". The term "gelated" is used in the art to describe an electrolyte that is at least part solid and at least part liquid. The term "solid" is used in the art to describe an electrolyte that is substantially a solid. It is unclear what form the electrolyte of claim 6 is limited to since "gelated" and "solid" are not equivalent terms for an electrolyte. For the purposes of this Action the claim will be examined as reciting "wherein the solid electrolyte contains a non-aqueous solvent."

Claim 13 recites "a molar ratio of the diene compound to lithium of the positive electrode is from 0.01-0.05", however, claim 1 does not require lithium.

To the extent the claims are understood in view of the rejections above, note the following prior art rejections.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 8, 9, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeda et al., US 5,658,687.

Takeda teaches a battery having a positive electrode including a current collector and active material, an electrolyte layer and an anode including a current collector and active material (see col. 11, lines 64-col. 12, lines 4). The electrolyte layer contains a high-molecular weight compound (polyethylene glycol/polymer matrix) with an electrolyte salt, for example

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LiPF₆ (claim 8) (abstract and col. 8, lines 8-18). As can be seen from Fig. 1 (claims 11,12), the solid electrolyte is between the positive and negative electrodes (acts as separator). A binder containing a cyclic diene, for example cyclopentadiene or 1,3-cyclohexadiene, may be included in the cathode (claim 4) and/or anode (see col. 9, lines 1-13). Non-aqueous solvents (claim 6) for the electrolyte salts, such as propylene carbonate (claim 9), are disclosed in col. 8, lines 40-55.

Thus the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Juichi et al, JP 09-035746 in view of Linden, Handbook of Batteries(pgs 36.1-36.3;36.13-36.16).

A machine translation of the Japanese patent has been obtained and a copy is attached.

Juichi teaches a cylindrical (claim 10) nonaqueous electrolyte lithium battery comprising a positive electrode, a negative electrode, a separator and an electrolyte. The positive electrode includes a lithium-containing oxide active material and an aluminum current collector (0012). The negative electrode includes a carbon active material and a copper current collector (0013). The separator (claim 12) includes a polypropylene material and is located between the positive and negative electrodes (0014). Juichi teaches an electrolytic solution including a lithium electrolyte salt and a solvent (claim 6) (0016). The solvent may be a mixture of ethylene carbonate, diethyl carbonate (claim 9) and 1,4-cyclohexadiene (claims 2,3) (0021). The

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electrolytic solution (contains the diene) is poured into the cell containing the positive electrode, negative electrode and separator (0016). The electrolytic solution will inherently disperse throughout the cell, thus, the positive electrode (claim 4), negative electrode and separator will contain the diene compound. The examples teach the lithium salt is LiPF_6 (claim 8).

Juichi does not explicitly state the electrolyte is a solid polymer electrolyte comprising an electrolyte salt dispersed in a matrix polymer. Juichi does not teach the matrix polymer material of claim 7.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Linden teaches that lithium batteries are known to have liquid electrolytes and solid electrolytes. Linden teaches that lithium batteries having a carbonaceous negative electrode material and an intercalation cathode material (LiCoO_2 in the examples of Juichi) may have either liquid organic electrolytes or solid polymer electrolytes (see Fig. 36.1 of Linden). Linden teaches that solid polymer electrolytes provide a safer design because of their lower reactivity with lithium (page 36.2). Linden teaches that a solid polymer electrolyte is formed by incorporating lithium salts into polymer matrices and that solid polymer electrolytes offer the advantage of flexibility of designing batteries in a variety of configurations (page 36.13). The polymer of the solid polymer electrolyte may be polyethylene oxide (page 36.16). One of skill would be motivated to use a solid polymer electrolyte for the lithium battery of Juichi in order to improve the safety and flexibility of the battery. Linden teaches that lithium batteries having a carbonaceous negative electrode material (graphite in the examples of Juichi) and an intercalation cathode material (LiCoO_2 in the examples of Juichi)

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may have either liquid organic electrolytes or solid polymer electrolytes. Thus, the skilled artisan would find the use of a solid polymer electrolyte for the lithium battery of Juichi obvious.

Allowable Subject Matter

Claim 5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

See Action of 2/13/03 for the reasons for allowance of claim 5.

Response to Arguments

Applicant's arguments filed 5/19/03 have been fully considered but they are not persuasive.

35 U.S.C. 112

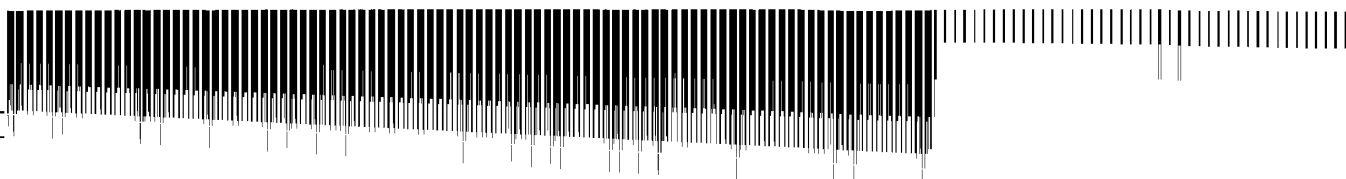
Applicant argues the rejection of claim 4 is rendered moot because claim 4 has been canceled. However, claim 4 was incorporated in claim 1, thus, the rejection now applies to instant claim 1.

Applicant argues claim 6 has been amended to overcome the rejection. However, claim 6 has not been amended.

35 U.S.C. 102(b)

Applicant argues Takeda et al fails to disclose or suggest the range of the diene compound recited in instant claim 1. However, as noted above:

It is unclear what the claim encompasses because in order to determine the amount of the diene compound, the diene compound and the components of the active material would have to be known. The claim should recite the same units for measuring the amount of the diene compound and the amount of the active material, otherwise it is not possible to convert between



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the two units of measurement in claim 1. Claim 1 will be examined as reciting "said diene compound is contained in the positive active material".

Takeda et al teaches a diene compound contained in the positive electrode.

35 U.S.C. 103(a)

Applicant argues Juichi et al fails to disclose or suggest the range of the diene compound recited in instant claim 1. However, as noted above:

It is unclear what the claim encompasses because in order to determine the amount of the diene compound, the diene compound and the components of the active material would have to be known. The claim should recite the same units for measuring the amount of the diene compound and the amount of the active material, otherwise it is not possible to convert between the two units of measurement in claim 1. Claim 1 will be examined as reciting "said diene compound is contained in the positive active material".

Juichi et al teaches a diene compound contained in the positive electrode.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "the amount of a diene compound is much less than that of the present invention of 75 vol%") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The rejected claims do not contain any limitations regarding the volume percent of the diene compound.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

June 18, 2003


Patrick Ryan
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